IN THE APPLICATION

OF

Daniel Chen

FOR

Optical Lens Drill Press

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Michael I. Kroll
Attorney for Applicant

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to a drill press and, more specifically, to a drill press designed to facilitate drilling apertures though the irregular curvature shape of an eyeglass lens.

The present invention eyeglass lens drill press is outfitted with specialized lens holding and displacement platform assemblies that allow the user to manipulate the angle and hold lenses in position, whereby selected areas pre-designated for the fabrication of holes or apertures can be produced at precision angles and sizes typically perpendicular to the lens's arc.

The drill press contains a fixed stand that supports a vertical column that is affixed to a motorized drill. An adjustment knob allows the motorized drill to transverse along the vertical column to a user defined position above the fixed stand. The fixed stand supports independent right and left holding platforms

that enable the user to define the proper lens position for drilling precision angles and sizes typically perpendicular to the lens's arc. The lenses are held between an upper and lower cup member having a threaded member for securing the lens therebetween.

In addition to vertical adjustment, the motorized drill press is pivotal about the vertical column to allow for improved accessibility to the holding platforms. The drill press is rotated 90 degrees away from the platform to provide the user means for loading and unloading of the optical lenses. A turn knob allows the drill to pivot freely when disengaged and locks the drill in a fixed position when engaged. A positioning block with a milled grove ensures the drill is centered over the holding platforms allowing proper working position

The drill press of the present invention provides means for a plurality of lateral and rotational movements. Conjointly the right and left platforms may be repositioned about the drill bit in both the x-axis and z-axis planes. In addition, the platforms may conjointly be pivoted lengthwise (forward and backward) relative to the horizontal axis.

The drill press of the present invention also provides means for independent movement of the platforms relative to one another. The dual platforms allow the user to drill both lenses without angular repositioning.

These conjoined and independent movements of the lens support platforms provide means for precision positioning of each lens allowing the user to properly orient the lens for perpendicular placement of apertures within the lens's arc.

The eyeglass lens drill press of the present invention provides means for the user to precisely control each of the conjoined and independent lateral and angular movements. Measurable scales are affixed to the platforms to specifically define the lateral and angular positions in relationship to the x, y, and z axis.

Utilizing a threaded member the user first secures each lens between the upper and lower elements of the lens holding device, whereupon adjustment knobs are then employed to reposition the lenses in selective lateral and angular directions allowing fabrication of apertures at precise angles.

Description of the Prior Art

Drill presses for eyeglass lenses have been provided in prior art. While these units may be suitable for the particular purpose to which they address, they would not be as suitable for the purposes of the present invention as heretofore described.

SUMMARY OF THE PRESENT INVENTION

A primary object of the present invention is to provide an improved drill press that accommodates the perpendicular positioning of unique curvatures of eyeglass lenses.

Another object of the present invention is to provide an improved drill press that provides dual securing members.

Yet another object of the present invention is to provide an improved drill press that provides conjoined lateral adjustment of dual platform members in the X–axis direction.

Still another object of the present invention is to provide an improved drill press that provides conjoined lateral adjustment of dual platform members in the Z–axis direction

Yet another object of the present invention is to provide an improved drill press that provides conjoined angular adjustment of dual platform members

along the horizontal axis.

One more object of the present invention is to provide an improved drill press that provides independent angular adjustment of dual platform members along the horizontal axis.

Still another object of the present invention is to provide an improved drill press that allows the drill to pivot away from the working surfaces for ease of lens setup and removal.

Yet another object of the present invention is to provide an improved eyeglass lens drill press that is simple and easy to use.

Additional objects of the present invention will appear as the description proceeds.

The foregoing and other objects and advantages will appear from the description to follow. In the description reference is made to the accompanying drawings, which forms a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments will be described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that structural changes may be made without departing from the scope of the invention. In the accompanying drawings, like reference characters designate the same or similar parts throughout the several views.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

In order that the invention may be more fully understood, it will now be described, by way of example, with reference to the accompanying drawing in which:

FIGURE 1 is an illustrative view of the present invention;

FIGURE 2 is an exploded perspective view of the present invention;

FIGURE 3 is a front view of the present invention;

FIGURE 4 is a top view of the present invention;

FIGURE 5 is a right side view of the present invention;

FIGURE 6 is a left side view of the present invention;

FIGURE 7 is a perspective view of the present invention's centering platform;

FIGURE 8 is a perspective view of the present invention's centering platform x-axis travel;

FIGURE 9 is a perspective view of the present invention's centering platform y-axis travel;

FIGURE 10 is a side view of the present invention's centering platform z-axis pivot;

FIGURE 11 is a side view of the present invention's centering platform z-axis pivot;

FIGURE 12 a front view of the present invention's centering platform x-axis pivot;

FIGURE 13 is a front view of the present invention's centering platform x-axis pivot;

FIGURE 14 is an exploded view of the holding element and lens;

FIGURE 15 is a detailed view of the drilling process of the present invention;

FIGURE 16 is a detailed view of the cutting process of the present invention; and

FIGURE 17 is a top view of the present invention.

DESCRIPTION OF THE REFERENCED NUMERALS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, the figures illustrate the Optical Lens Drill Press of the present invention. With regard to the reference numerals used, the following numbering is used throughout the various drawing figures.

10 Optical Lens Drill Press

12 drilling assembly

14 lateral oscillation assembly

16 upper shift assembly

17 sidewalls of 16

18 lower shift assembly

20 base

21 drill stanchion

22 lens holding assembly

24 lens pedestal of 14

26 lens clamp

27 lens clamp head

28 lens clamp knob

30 threaded lens clamp shaft

32 transverse brace of 22

34 threaded recess of 32

36 front support post

38 rear support post

40 lateral oscillating table

41 rocker assembly

42 drill

43 drill bit

46 adjustment dials

48 optical lens

50 milling cutter

52 drilled recess

54 milled slot

56 armature

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The following discussion describes in detail one embodiment of the invention and several variations of that embodiment. This discussion should not be construed, however, as limiting the invention to those particular embodiments. Practitioners skilled in the art will recognize numerous other embodiments as well. For a definition of the complete scope of the invention, the reader is directed to the appended claims.

Figure 1 is an illustrative view of the present invention **10**. The present invention **10** being an eyeglass lens drill press **10** outfitted with a specialized lens holding **14** and displacement assembly mounted on the base **20** of the drill press assembly **12** that allows for the user to manipulate and angle a held lens in a position, whereby selected areas pre-designated for the fabrication of holes or apertures can be produced by a drill bit **43** at precision angles and sizes typically perpendicular to the curvature of the lens. The target point to be drilled is position under the drill bit **43** by adjusting the y-axis with the lower shift assembly **18** and the x-axis with the upper shift assembly **16** accordingly and the arcuate surface of the lens is placed in perpendicular relation the the drill bit **43**

by rotating the y-axis with the rocker assembly **16** and the x-axis with the lateral oscillating shift assembly **14**.

Figure 2 is an exploded perspective view of the present invention **10**. Shown are the components and assemblies of the present invention **10** broken down into their individual parts to depict the way in which and how the present invention **10** may be constructed so as to provide an optical lens drill press **10** precise rotational capacity. The drill press assembly **12** is mounted on a stanchion **21** attached to a base member **20** with the drill **42** substantially disposed thereabove. The lower shift assembly **18** is mounted on said base member in a manner to permit it and all related components mounted thereon to selectively be incrementally positioned along the y-axis of said base **20** as needed and then locked into that position. The upper mounting assembly **18** is similarly mounted on said lower mounting assembly **16** to provide for travel along the x-axis. A rocker assembly **41** is pivotally attached to the sidewalls **17** of the upper shift assembly **16** thereby providing the axial rotation of the rocker assembly **41** and all related components mounted thereon along the y-axis. Two lens holding assemblies **22** are provided to retain the lens or lenses to be drilled

on lateral oscillating shift assemblies **14** pivotally mounted in said rocker assembly **41**.

Figure 3 is a front view of the present invention **10**. Depicted is a front view of the present invention **10** depicting a drilling assembly **12** suspended above a pair of lens holding assemblies **22** and lateral oscillating shift assemblies **14**, a rocker assembly **41**, an upper shift assembly **16** and a lower shift assembly **18** capable of moving and orientating an eyeglass lens anywhere along an x, y, or z axis, and of lateral side to side oscillation enabling the user to position the drill **42** and drill bit **43** relative to the lens at any conceivable location or angle. A plurality of adjustment dials **46** are provided to incrementally move each component to the desired position.

Figure 4 is a top view of the present invention **10**. Shown is the top of the present invention depicting the lens holding assemblies **22** on the lateral oscilating shift assemblies **14** used for the retention and securement of eyeglass lens during the drilling process.

Figure 5 is a side view of the present invention **10**. Shown is the present is the drill assembly **12** with a drill bit **43** installed therein positioned above a lens holding assembly **22** on a lateral oscillating shift assembly **14** pivotally disposed within a rocker assembly **41** that is pivotally mounted on the sidewalls of the upper shift assembly **16** that is slidably engaged with the lower shift assembly **18** which is slidably mounted on the base member **20**.

Figure 6 is a left side view of the present invention **10**. Shown is the present is the drill assembly **12** with a drill bit **43** installed therein positioned above a lens holding assembly **22** on a lateral oscillating shift assembly **14** pivotally disposed within a rocker assembly **41** that is pivotally mounted on the sidewalls of the upper shift assembly **16** that is slidably engaged with the lower shift assembly **18** which is slidably mounted on the base member **20**.

Figure 7 is a perspective view of the present invention's centering platform. Shown is a detailed view of the platform of the present invention **10**, depicting a plurality of lateral oscillating assemblies **14** with lens holding elements **22** thereon coupled to a rocker assembly **41** pivotally connected to the

sidewalls **17** of the upper shift assembly **16** that allows a lens held by the lens holding assembly **22** to be moved to a respective angle and orientation whereby when drilled, the holes created are perpendicular to the curvature of the lens. The lens holding assembly **14** comprises a lens pedestal **24** centrally disposed on the lateral oscillation table **40** and a lens clamp **26** having a lens clamp knob **28** communicating with a lens clamp head **27** via a threaded shaft **30** threaded into a threaded recess **34** in a transverse brace **32** suspended by a front support post **36** and a rear support post **38**.

Figure 8 is a perspective view of the present invention's **10** centering platform x-axis travel. Shown is the present invention **10** having an eyeglass lens **48** mounted in between the holding elements **22** for later drilling. Additionally shown is the method by which the present invention **10** moves the lens **48** into place traveling along the x axis by sliding the upper shift assembly **18** to the left or right over the lower shift assembly's **16** top surface until a desired position is secured.

Figure 9 is a perspective view of the present invention's **10** centering platform y-axis travel. Shown is the present invention **10** having optical lenses **48** mounted in holding elements **22** for later drilling. Additionally shown is the method by which the present invention moves the lens **48** into place traveling along the y-axis by sliding the lower shift assembly **18** to the front or back over the base's **20** top surface until a desired position is secured.

Figure 10 is a side view of the present invention's **10** centering platform z-axis pivot. Shown is the present invention **10** having optical lenses **48** mounted within the holding element **22** whereby the angle of incidence of the lens **48** relative to the drill bit **43** in the drilling assembly **12** may be changed via adjustment of the rocker assembly **41** in a forward tilt. The angle adjustment allows the user to drill holes perpendicular to the arcuate surface and structure of the lens **48**.

Figure 11 is a side view of the present invention's **10** centering platform z-axis pivot. Shown is the present invention **10** having eyeglass lenses **48** mounted within the holding element **22** whereby the angle of incidence of the

lens **48** relative to the drill bit **43** in the drilling assembly **12** may be changed via adjustment of the rocker assembly **41** in a backward tilt. The angle adjustment allows for the user to drill holes perpendicular to the arcuate surface and structure of the lens **48**.

Figure 12 is a front view of the present invention's **10** centering platform x-axis pivot. Shown is the present invention **10** having eyeglass lenses **48** mounted in the holding elements **22** and being tilted inward by means of the user manipulating the lateral oscillating shift tables **40** inward so that the area of the lens **48** to be drilled is perpendicular to the drill bit **43**.

Figure 13 is a front view of the present invention's **10** centering platform x-axis pivot. Shown is the present invention **10** having optical lenses mounted in the holding elements **22** and being tilted outward by means of the user manipulating the lateral oscillating shift tables **40** outward so that the area of the lens **48** to be drilled is perpendicular to the drill bit **43**.

Figure 14 is an exploded view of the lens holding elements **22** and lenses **48**. The lens holding assembly **14** comprises a lens pedestal **24** centrally disposed on the lateral oscillation table **40** and a lens clamp **26** having a lens clamp knob **28** communicating with a lens clamp head **27** via a threaded shaft **30** threaded into a threaded recess **34** in a transverse brace **32** suspended by a front support post **36** and a rear support post **38**.

Figure 15 is a detailed view of the drilling process of the present invention. Shown is the present invention having an eyeglass lens **48** being held in position relative to the drill bit **43** by the holding element **22** in a position that cooperates with the orientation of the lateral oscillating shift table **14** to produce a hole drilled into the lens that is perpendicular to the arc of the lens **48** surface and structure.

Figure 16 is a detailed view of the cutting process of the present invention. Shown is the present invention having an eyeglass lens **48** being held in position relative to the milling cutter **60** by the holding element **22** in a position that cooperates with the orientation of the lateral oscillating table **40** to produce the result of an milled slot **52** being cut into the lens **48** that is

perpendicular to the arc of the lens's **48** surface and structure. The user turns the adjustment knob for the upper shift assembly to move the lens **48** back and forth as the spinning milling bit **50** cuts the aperture.

Figure 17 is a top view of the present invention **10**. The illustration depicts the pivotal swing of the drill press assembly **12** on a rotatable armature **56**. The drill press assembly **12** is pivotal about the vertical stanchion **21** to allow for improved accessibility to the holding platforms. The drill press assembly **12** is rotated away from the platform to provide the user means for loading and unloading of the optical lenses. A turn knob allows the drill **12** to pivot freely when disengaged and locks the drill **12** in a fixed position when engaged. A positioning block with a milled groove ensures the drill is centered over the holding platforms allowing proper working position.

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

While certain novel features of this invention have been shown and described and are pointed out in the annexed claims, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.